

REMARKS

Applicants wish to thank Examiner Church for the telephonic interview, and for his courtesy in assisting Applicants to advance prosecution of the subject application.

Amendments to claims 1, 10, 29, and 37 are to make explicit of what was already inherent in the claims. Support for the amendments can be found at least in paragraphs 36, 37, and 52 of the specification. Amendment to claim 12 is to rewrite claim 12 in independent form. Amendments to claims 13-15, 17, and 19 are to change claim dependencies. Amendments to claims 22-24 are to bring these claims into conformity with the language of their base claim. Amendment to claim 25 is for the purpose of clarifying what Applicants regard as the invention. No new matter has been added.

I. **CLAIM REJECTIONS UNDER U.S.C. § 102/103**

Claims 1-7, 9-19, 22-30, and 34-39 stand rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent No. 6,307,914 (Kunieda). Claim 11 has been canceled. With respect to the remaining claims, Applicants respectfully note that in order to sustain a rejection under §102, each element in the rejected claim must be found, either expressly or inherently, in the cited reference.

Claims 1-10

Claims 1 and 10 have been amended to each recite the steps of *determining a relative position* between at least one marker and the target. As discussed with the Examiner, Kunieda does not disclose or suggest such limitation. As such, Applicants believe that the amendments to claims 1

and 10 have overcome the claim rejections, and respectfully requests for an allowance to claims 1-10.

Claims 12-20

Claim 12 recites a control module for controlling a multiple leaf collimator *to track a movement of a target and switching off a radiation source* in response to an image signal. Kunieda does not disclose or suggest such control module. Particularly, Applicants note that Kunieda does not disclose or suggest an irradiating device that is configured *both* to control a multiple leaf collimator and to switch off a radiation source in response to an image signal. As such claims 12-20 are believed allowable over Kunieda.

Claims 22-28

Claim 25 recites generating a tracking signal in response to the first image signal to track a movement of a portion of a target, and adjusting a first multiple leaf collimator in response to the tracking signal to adjust *a shape* of a radiation beam. Kunieda does not disclose or suggest such limitations. Rather, Kunieda teaches performing an *inverse operation* from a moving amount of a tumor marker 17 (Column 16, lines 25-37). This means the collimator leafs are positioned in an opposite direction from the tumor movement. However, such operation would fail to “track” a tumor. In order to “track” a tumor, the collimator leafs on both sides of the collimator should move in the same direction (not a “reverse” direction) as that of the tumor movement.

According to the Office Action, performing an “inverse” operation means that as the tumor moves across the treatment beam, one side of the collimator opens while the other side of the collimator closes, so that the tumor remains centered in the beam (citing column 16, lines 25-37). However, Applicants respectfully submit that this section of Kunieda does not provide such meaning

for the “inverse” operation, and that this section of Kunieda is not enabling (Note that in column 16, lines 4-9, Kunieda describes moving a treatment base in an “inverse operation” - i.e., moving the treatment base in an opposite direction by the same amount of a tumor movement, in order to compensate for tumor movement. However, the same “inverse operation” would render the collimator embodiment described in column 16, lines 25-37 inoperable, as discussed previously). Moreover, even under the interpretation suggested by the Examiner, Kunieda does not disclose or suggest the above limitations. Particularly, under this interpretation, all of the collimator leaves would move such that the same beam shape is maintained. As such, Kunieda does not disclose or suggest *adjusting a shape* of a radiation beam. For at least the foregoing reasons, claim 25 and its dependent claims 22-24 and 26-28 are believed allowable over Kunieda.

Claims 29, 30, and 37-39

Claims 29 and 37 have been amended to each recite collecting a plurality of images at a plurality of phases in a *physiological* cycle. Applicants agree with the Examiner that Kunieda discloses different “phases” of a machine cycle, not physiological cycle. As such, amended claims 29 and 37, and their respective dependent claims are believed in condition for allowance.

Claims 34-36

Claim 34 recites *using an anatomy of a patient as a marker, and establishing a relationship of the marker relative to the target*. According to the Office Action, columns 1 and 2 of Kunieda describes using an anatomy of a patient to locate a region to be treated. However, columns 1 and 2 of Kunieda discloses a system for *directly* detecting a position of a target, and adjusting a position of a patient such that the target is aligned with previously determined position (column 2, lines 46-52). Because in Kunieda, the anatomy being detected is coextensive with the target, Kunieda does not

disclose or suggest *establishing a relationship of the marker relative to a target*. For example, the marker may be a nearby piece of anatomy, or may be a portion of the tumor itself. In either case, the present invention as claimed requires that a relationship between the marker and the target be established, which is nowhere taught or suggested by Kunieda. For at least the foregoing reason, claims 34-36 are believed allowable over Kunieda.

II. INFORMATION DISCLOSURE STATEMENTS

Applicants wish to bring to the attention of the Patent Office the references listed on the attached IDSs, which were previously submitted on March 4, 2003 (please note that only the second page of form PTO/SB/08A has not been considered; the first page of form PTO/SB/08A has already been considered), and March 17, 2003, and requests that they be considered by the Examiner.


CONCLUSION

Based on the foregoing, all remaining claims are believed in condition for allowance. If, the Examiner has any questions or comments regarding this amendment, please contact the undersigned at the below-listed number.

Respectfully submitted,

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Dated: 8/24/04

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Enclosures: Copies of previously submitted IDSs.